AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1-58. (Canceled)

59. (Previously Presented). A method of fabricating an electronic device using biomolecules comprising:

forming first and second electrodes on a substrate;

extending bridging DNA between said first and second electrodes;

providing at least one RNA complementary to a region of said bridging DNA wherein said at least one RNA and said bridging DNA bond to form at least one R-loop; and

bonding at least one nanoparticle to said DNA within said at least one R-loop.

60. (Previously Presented). The method according to claim 59, further comprising arranging an electrically conducting material on said bridging DNA.

61. (Previously Presented) The method according to claim 59, further comprising arranging a first linker nucleic acid on said first electrode and a second linker nucleic acid on said second electrode.

62. (Canceled).

63. (Previously Presented). The method according to claim 61, wherein:

said first and second linker nucleic acid are single-stranded, sulfur-terminated, and include from about five to about twenty bases, and said first linker nucleic acid has a first sequence and said second linker nucleic acid has a second sequence different from said first sequence; and

said bridging DNA comprises a first sticky end having a sequence complementary to and hybridizing with said first linker nucleic acid and a second sticky end complementary to and hybridizing with said second linker nucleic acid.

64. (Previously Presented) The method according to claim 63, further comprising attaching said first linker to said first electrode and said second linker to the second electrode; and

hybridizing said first sticky end to said first linker and said second sticky end to said second linker.

65. (Canceled).

66. (Previously Presented). The method according to claim 63, wherein arranging a first linker nucleic acid on said first electrode and a second linker nucleic acid on said second electrode comprises:

contacting said first electrode with a solution of said first linker;

contacting said second electrode with a solution of said second linker;

bonding said sulfur-termination to said electrode; and

rinsing said solutions from said electrodes.

67. (Previously Presented). The method according to claim 66, further comprising:

contacting a region of the substrate between said first and second electrodes with a solution of said bridging DNA; and

aligning said bridging DNA from said first electrode to said second electrode.

68. (Previously Presented). The method according to claim 67, wherein the DNA molecule is aligned by inducing an electric field of a flow field between the two electrodes.

69. (Previously Presented). The method according to claim 68, further comprising:

contacting said bridging DNA with a molecule of RNA, wherein said RNA is complementary to a portion of said DNA;

forming an R-loop in said DNA, wherein the DNA in said R-loop includes at least one region pair-bonded with said RNA and at least one non-bonding region free of pair-bonds; and

attaching a nanoparticle to said non-bonding region.

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70. (Previously Presented). The method according to claim 69, further comprising the step of:

functionalizing the nanoparticle with at least one nucleotide complementary to at least one base of the portion of the DNA loop within the R-loop prior to attaching it to the DNA within the R-loop.

71. (Previously Presented). The method according to claim 70, further comprising the step of:

forming a suspension of the nanoparticle and dispensing the suspension of the nanoparticle on the DNA molecule extending between the first electrode and the second electrode.

72. (Previously Presented). The method according to claim 71, further comprising: depositing an electrically conducting material on said bridging DNA.

73. (Previously Presented). The method according to claim 71, wherein depositing electrically conductive material on said bridging DNA comprises:

immersing said substrate in a silver-containing solution thereby forming silver salts with phosphate groups of said bridging DNA; and

reducing said silver salts to metallic silver.

74. (Previously Presented). The method according to claim 73, wherein reduction of the silver salt comprises the steps of: exposing the silver salt to a reducing agent.

75. (Previously Presented). The method according to claim 74, wherein reduction of the silver salt comprises the steps of: exposing the silver salt to hydroquinone/OH^- followed by hydroquinone/H^+.

76. (Previously Presented). The method according to claim 60, further comprising the step of:

providing a third electrode on the substrate between the first electrode and the second electrode.

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77. (Previously Presented). The method according to claim 76, further comprising: forming capacitive linkages between the electrically conducting material on said bridging DNA and the third electrode.

78. (Previously Presented). The method according to claim 76, further comprising: electrically connecting the electrically conducting material on said bridging DNA to said third electrode to form an OR gate.

79. (Previously Presented). The method according to claim 60, further comprising:
providing a third electrode and a fourth electrode on the substrate;
extending a second bridging DNA between the third electrode and the fourth electrode, and
bonding at least one nanoparticle to said second bridging DNA.

80. (Canceled).

81. (Previously Presented). The method according to claim 79, further comprising the step of:
electrically connecting the organic molecules and the electrodes to form an OR gate.

82. (Previously Presented) The method according to claim 79, further comprising the step of:
electrically connecting one of the first electrode and the second electrode to one of the third electrode and the fourth electrode; and electrically connecting the other of the first electrode and the second electrode to the other of the third electrode and the fourth electrode.

83. (Previously Presented). The method according to claim 59, wherein a plurality of nanoparticles are bonded at a plurality of locations on said bridging DNA.

84. (Cancelled).

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85. (Previously Presented) The method according to claim 59 wherein said first and second electrodes comprise gold.

86. (Previously Presented) The method according to claim 59 wherein said bridging DNA is double stranded.

87. (Previously Presented) The method according to claim 59 wherein said bridging DNA is λ-DNA.

88. (Previously Presented) The method according to claim 59 wherein at least one nucleotide is attached to said nanoparticle.

89. (Previously Presented) The method according to claim 88 wherein said at least one nucleotide is complementary to at least one nucleotide of said bridging DNA molecule within said R-loop.

90. (Previously Presented) The method according to claim 88 wherein said at least one nucleotide is complementary to at least one nucleotide of the DNA molecule within the R-loop at a location equidistant from the first electrode and the second electrode.

91. (Previously Presented) The method according to claim 61 wherein said first and second linker nucleic acids are selected from the group consisting of RNA and DNA.

92. (Previously Presented) The method according to claim 61 wherein said first and second linker nucleic acids are sulfur terminated and single stranded.

93. (Previously Presented) The method according to claim 61 wherein said first linker nucleic acid has a different sequence than said second linker nucleic acid.

94. (Previously Presented) The method according to claim 61 wherein each of said linker nucleic acids consists of from about five to about 100 base pairs.

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95. (Previously Presented) The method according to claim 79 wherein said third electrode has a width of about 100 nm to about 5000 nm.

96. (Previously Presented) The method according to claim 79 wherein said third electrode has a width of less than 100 nm.

97. (Previously Presented) The method according to claim 79 wherein said third electrode is perpendicular to said bridging DNA.

98. (Previously Presented) The method according to claim 79 wherein said bridging DNA contacts said third electrode.

99. (Previously Presented) The method according to claim 59 wherein said first and second electrodes are separated by a distance of about 1μm to about 100μm.

100. (Previously Presented) The method according to claim 59 wherein the first electrode and the second electrode are made of an oxide-free material.

101. (Previously Presented) The method according to claim 59 wherein the first electrode and the second electrode terminate in sharp tips that face each other.

102. (Previously Presented) The method according to claim 59 wherein the substrate comprises a glass.

103. (Previously Presented) The method according to claim 79, wherein said fourth electrode is positioned between the first electrode and the second electrode.

104. (Previously Presented) The method according to claim 103 wherein the fourth electrode has a width of about 100 nm to about 5000 nm.

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105. (Previously Presented) The method according to claim 103 wherein the fourth electrode has a width of less than 100 nm.

106. (Previously Presented) The method according to claim 103 wherein the fourth electrode is perpendicular to said bridging DNA.

107. (Previously Presented) The method according to claim 103 wherein said bridging DNA contacts the third electrode and the fourth electrode.

108. (Previously Presented) The method according to claim 76, further comprising electrically connecting the electrically conducting material on said bridging DNA to said third electrode to form an AND gate.

109. (Previously Presented) The method according to claim 79 further comprising:

providing a fifth electrode on the substrate arranged at least between the first electrode and the second electrode; and

providing a sixth electrode on the substrate arranged at least between the third electrode and the fourth electrode.

110. (Previously Presented) The method according to claim 109 wherein said bridging DNA contact the fifth electrode and the sixth electrode; and the electrodes and the DNA molecules are electrically connected together to form an OR gate.

111. (Previously Presented). The structure according to claim 109, wherein one of the first electrode and the second electrode is electrically connected to one of the third electrode and the fourth electrode and the other of the first electrode and the second electrode is electrically connected to the other of the third electrode and the fourth electrode.

112. (Previously Presented) The method according to claim 59 further comprising: a plurality of nanoparticles bonded to the bridging DNA.

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